



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/519,727	03/03/2000	Kok-Wui Cheong	STFUP014	6703

7590 03/09/2005  
CRAWFORD MAUNU  
1270 NORTHLAND DRIVE SUITE390  
ST PAUL, MN 55120

EXAMINER
----------


CORRIELUS, JEAN B

ART UNIT	PAPER NUMBER
----------	--------------

2637

DATE MAILED: 03/09/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 09/519,727	<b>Applicant(s)</b> CHEONG ET AL. 	
	<b>Examiner</b> Jean B Corrielus	<b>Art Unit</b> 2631	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 12 October 2004.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-4, 6-24, 26-29, 31 and 32 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 7-24 is/are allowed.
- 6) ☒ Claim(s) 1, 3, 4, 6, 26, 28, 31 and 32 is/are rejected.
- 7) ☒ Claim(s) 2 and 29 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03 March 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All   b) ☐ Some \*   c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.  
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                  | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____  |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)         | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: _____                                    |

### DETAILED ACTION

1. The finality of the rejection of the last Office action is withdrawn in view of the following new ground of rejection(s).
2. The indicated allowability of claims 1, 3, 4, 6, 26-28, 31 and 32 is withdrawn in view of the newly discovered reference to Bremer, US Patent 6,160,790. Rejections based on the newly cited reference(s) follow.

### ***Drawings***

3. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the step/means for iteratively computing a probable cross talk signal step or means for calculating the data based on the iteratively computed probable cross talk converging toward the superimposed cross talk, means/step for computing a probable desired signal estimate, as recited in claims 1, 2, 26-29, 31 and 32, must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not

Art Unit: 2637

be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Claim Objections***

4. Claims 2, 27, 29 and 32 are objected to because of the following informalities:

Claim 2, line 3, "estimates" should be "signals" so as to be consistent with antecedent in claim 1; line 2, "are" should be "is".

Claim 27, line 8, "signals" should be "signal" so as to be consistent with antecedent in line 5.

Claim 29, line 3, "estimates are" should be "estimate is".

Claim 32, last line, ""signals" should be "signal" so as to be consistent with antecedent in line 6.

Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 1-4, 6, 27-29 and 32 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1, lines 7-8, recites “the iteratively computed probable cross talk signals converging toward the superimposed cross talk”. However, it is unclear how a **plurality of probable cross talk signals** will converge toward a **single signal (superimposed cross talk)** as the plurality of probable cross talk signals are generated as a result of refining a previous probable cross talk into a better probable cross talk. The better probable cross talk itself is further refined into another probable estimate and the process continues until a desired result is reached, i.e., convergence toward the superimposed cross talk. In other words, at the end of the process, only the final probable cross talk should result in converging toward the superimposed cross talk not all the probable cross talk estimates.

The same comment applies to claim 28.

As per claim 27 is rejected as being incomplete as a key limitation, i.e., “toward the superimposed cross talk” is omitted after converging. The same comment applies to claim 32.

Art Unit: 2637

Claims 2-4, 6, and 29 are likewise rejected because of their dependency to a rejected base claim.

***Claim Rejections - 35 USC § 102***

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

8. Claims 1, 26-28, 31 and 32 are rejected under 35 U.S.C. 102(e) as being anticipated by Bremer US Patent No. 6,160,790.

As per claims 1 and 28, Bremer teaches a method and apparatus (figs. 5 and 6) comprising receiving an input signal (17b) that includes a primary data signal and an interference portion see col. 5, lines 26-28); repetitively (iteratively) generating (computing) a cancellation signal 27a-d (probable cross talk signal) using device 21a-21d and producing a plurality of cancellation signals 27a-d (probable crosstalk signals); the receiver 15b is set to received the output of the adders 29a-29d in which no cross talk is present to generate the data signal note that at col. 6, lines 46-51, Bremer teaches that the signal input to the receiver is free of crosstalk. In order for such a signal to be free of crosstalk, the cancellation signal has to resemble/converge toward the superimposed cross talk signal.

As per claims 26 and 31, a predetermined number of repetitions (iterations) are carried out see fig. 5 elements 21a-d.

As per claims 27 and 32, Bremer teaches that the signal input to the receiver is free of crosstalk. In order for such a signal to be free of crosstalk, the cancellation signal has to resemble/converge toward the superimposed cross talk signal.

### Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 27 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sakurai et al US Patent No. 5,594,756.

As per claim 27, Sakurai teaches a method and apparatus comprising receiving an input signal that includes a primary data signal and an interference portion see col. 1, lines 14-26; iteratively computing an estimate (probable) of the interference portion using estimator 80 (note that the noise portion is iteratively computed because of the presence of the feedback path); calculating the data signal based on at least in part upon the iteratively computed estimate (probable) interference portion see col. 1, lines 48-53. Note that in order for the superimposed interference (crosstalk) to be removed or canceled from the received signal, the estimate (probable) interference (crosstalk) inherently has to

Art Unit: 2637

be as close as possible to (resemble) the superimposed interference (crosstalk) and it is also an indication of convergence. Sakurai does not explicitly teach that the interference signal is a crosstalk signal. Cross talk signal, however, is well known in the art as a type of interference signal if left uncompensated for could cause distortion in the original signal. Given that, it would have been obvious to one skill in the art to modify Sakurai in such a way as to provide compensation for cross talk signal so as to ensure that the reconstructed signal is as closed as possible to the original signal.

Claim 32 is rejected similarly as claim 27, as both include similar limitations.

11. Claims 3, 4 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bremer in view of applicant's background of the invention.

As per claims 3 and 4, Bremer discloses the invention substantially as claimed by does not teach that the signal is a multicarrier signal such as discrete multitone. However, configure a system for processing a multicarrier signal such a DMT is old and well established in the art. For instance, Applicant's background of the invention teaches at page 2, lines 4-6 the processing of a multicarrier signal. Given that fact it would have been obvious to one skill in the art to configure Bremer for processing a multicarrier signal such as DMT in order to facilitate transmission of information at higher rate over the twisted-pair phone lines.

As per claim 6, applicant background of the invention page 2, line 31- page3, line 10 teaches that the VDSL technology is well established in the art. Given that fact, it would have been obvious to one skill in the art to configure



Bremer in such a way to receive VDSL signal in order to carry high speed communication over the twisted pair phone lines.

***Allowable Subject Matter***

12. Claims 7-24 are allowed.


13. Claims 2 and 29 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jean B Corrielus whose telephone number is 571-272-3020. The examiner can normally be reached on Maxi-Flex.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jay Patel can be reached on 571-272-3086. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 2637

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Jean B Corriellus  
Primary Examiner  
Art Unit 2637

3/7/05